

Get moving! Self-management support using mobile technology : a counselling protocol extended with a web-based coaching system to promote physical activity in patients with COPD or type 2 diabetes in primary care: the It's LiFe! study

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CHAPTER 9

Valorisation

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Valorisation

Lifestyle coaching 2020: a use case

Despite the fact that Mr. Black is actually a digital immigrant, born in the last century when Internet did not yet exist, he carries his smartphone always with him. He is rather overweight and suffers from high blood pressure, for which he uses daily medication. Without suggesting a direct causal relationship, he has an extremely unhealthy lifestyle combined with a stressful busy job and a heartfelt hate towards sports of any kind. His way to relax is to cook, read or watch TV. Coffee with chocolates and wine with French cheese are his favourite daily intake.

His digital bathroom scale is connected via his smartphone with his personal health record (PHR) and whenever he weighs himself, his weight and BMI is automatically recorded therein. But he does not like to measure his weight, because he finds that quite annoying. On the other hand, he checks his blood pressure regularly via his smart watch, because he wants to know if the medication is doing its job. His blood pressure values are automatically uploaded to his PHR in a similar way as his weight. When he orders medication online, the system of his GP automatically requests access to his PHR to check his weight and blood pressure values. The GP system interprets these values and sends a warning message: 'You are seriously at risk, may we follow your activity data over a period of 10 days?' Measuring his physical activity takes place automatically via his smart watch. 'Alright then', he thinks, and he gives permission within his PHR to access this data as well'.

The results are obvious; he falls far short of meeting the standard for healthy exercise. So after ten days he gets an offer from a company called 'Lifestyle for you', a partnership between his employer and his health care insurer, to try out a new program called 'lifestyle coaching 2020'. This program starts with a screen session with a lifestyle coach. She is a nurse, who works from her home located in a suburb of New Delhi. She asks permission to access his PHR and sees that he has been treated before by a dietitian, unfortunately with no results. Mr. Black notes that the conversation with her is pleasant; he dares to talk about his insecurities and his estimation that he lacks perseverance and probably will fail again. She is not in any way patronizing and he likes that in particular. Together with the nurse, they estimate what his preferences and habits concerning diet and exercise, they talk about achievable goals, what type of assistance he needs and where 'quick profit' can be achieved.

After subscribing to the program, giving some basic information and answering questions about his actual lifestyle, the system can not only view his physical activity data, but through very brief question and answer sessions with a virtual coach, the system gets a total picture of his lifestyle. He stated his preference to get these questions and answers from the system through voice messages and voice recognition (Siri) because he is accustomed to this when he uses his smartphone. In this way, a user profile is being built and consequently the system sends exactly at key moments personalized messages that help him to change his behaviour. These messages are based on the amount of daily physical activity, his blood pressure levels, his whereabouts, and they are given at times when he is tempted to overeat (at some point he also linked his smart fridge to the system) or when he is sedentary for too long. The messages come from a huge open source database that all app vendors of lifestyle coaching systems are using in collaboration. Through artificial intelligence this database provides the most motivating and suitable coaching messages.

Introduction

The research in this dissertation resulted in an effective blended mobile health intervention executed by practice nurses to stimulate physical activity. The intervention consists of a monitoring and feedback tool, an associated coaching system and a counselling protocol. More research is needed to evaluate the effects of this intervention on a larger scale and its cost-effectiveness. However, there are already relevant insights gained during the user-centred development and evaluation of the intervention which are of importance for the value-creation for the different stakeholders involved. Therefore this chapter focusses on emerging opportunities for valorisation that could be taken on the basis of the research presented in this dissertation. Furthermore, this chapter also describes which actions have already been taken to disseminate the knowledge gained in this research. The following definition of ‘valorisation’ is assumed: The process of value-creation out of knowledge, by making this knowledge suitable and available for economic or societal utilization and to translate this into high-potential products, services, processes and industrial activity.¹ It concerns the value that can be created through the transfer of scientific knowledge gained during *the It’s LiFe!* project; not only commercializing the monitoring and feedback tool and the coaching system, but also the transfer of acquired knowledge in order to carry out the intervention.

Relevance

Worldwide many people are not sufficiently active. This is a major problem since physical inactivity has major health effects. According to the World Health Organization insufficient physical activity is one of the ten leading risk factors for death worldwide and a key risk factor for non-communicable diseases, such as diabetes, cancer and cardiovascular disease. Therefore a lot of initiatives are undertaken to encourage people to become more active, such as national campaigns and initiatives at school, at work and in the neighbourhood. Also primary care providers try to stimulate physical activity of patients. The *It’s LiFe!* intervention helps people with COPD or diabetes type 2 to become more active. More generally, the results of the studies of this dissertation indicate that guidance by a care provider can be reinforced by daily monitoring, feedback and goal setting.

Target groups

For the following different target groups the results of the *It’sLiFe!* project are valuable.

Patients

In the studies presented in this dissertation the focus was on people with COPD or type 2 diabetes, aged between 40 and 70, but there is actually no need to set a maximum age to the target group. The most important non-age-related condition is that the patient is triggered to change, in the possession of a smartphone and able to download the app.

The following activities were undertaken to inform the current target group. Patients randomised in the tool group had access to a special website² with information about physical activity and about the use of the tool. All participating patients in the trial received an overview of their physical activity data afterwards. They also received the PAM accelerometer, which they could use optionally in order to continue with self-monitoring of their daily activity. Furthermore, participating patients received newsletters about the project to inform them about the overall results and conclusions of the studies. During the project the patient representatives acted as ambassador, but further dissemination of knowledge could be done by bringing the results to the attention of other COPD or diabetes type 2 patients through the regular information channels of the patient associations.

As the conditions of people with COPD and type 2 diabetes are very diverse, it is to be expected that the intervention could be beneficial for all people who visit the practice nurse regularly and experience barriers to become more physically active. One could even think about using it as a preventive tool for chronic conditions to guide people in general that could benefit from more physical activity regardless their current condition. Therefore, additional actions could be taken to inform a wider public in many different ways such as articles in newspapers and information on websites. The latter was already done by the companies involved in the project.^{3,4}

Health-care professionals

In this research the Self-management Support Program (SSP) was applied by practice nurses. Those nurses were chosen as a mode of delivery since they are explicitly responsible for the promotion of a healthy lifestyle. However, the intervention could also be applied by other care professionals who stimulate a healthy lifestyle, such as physiotherapists, dietitians when treating people with obesity, and general practitioners. Experiences gathered from COPD patients during the user centred design process indicated that especially during rehabilitation programs, which focus on improving exercise capacity, more attention is needed on physical activity in daily living. Patients indicated that extra guidance after a rehabilitation program is desirable to maintain the benefits. Furthermore, employees from fitness centres, municipalities and people involved in neighbourhood initiatives that focus on stimulating physical activity could use the knowledge gained during *the It's LiFe!* project.

To inform the professionals involved in the studies, newsletters about the project were sent to them, and those letters were also available on a special website.⁵ Furthermore, several articles were posted in professional journals for nurses, general

practitioners and physical therapists. In addition, the end results were announced on (inter)national conferences, which were attended by various health professionals involved in eHealth and chronic care. Finally, it is important that the end results of the project, which are currently described in English-language scientific journals, will also be published in Dutch professional journals.

The importance of an active lifestyle and how to encourage this should be a standard part of the training for healthcare professionals. Some study results have already been described in a newsletter of the professional association of nurses V&VN VZI (nurses and healthcare informatics),⁶ but the adapted five A's model for physical activity counselling, expanded with the use of the monitoring and feedback tool could also be of interest for practice nurses who are not acquainted with eHealth interventions. The consultation cards, designed to support the practice nurses in how to perform the consultations, are a ready-to-use instrument in the implementation of the intervention on a larger scale. In addition, the knowledge gained in this project will be made available through EIZT, the Centre of Expertise for Innovative Care and Technology of Zuyd University of Applied Sciences.⁷ At this centre, teachers/researchers are working together to give 'technology in care' a more explicit place in the curricula of the various study programs of the faculty of health.

Industry

Despite the growing emphasis on eHealth in recent years to improve care processes and outcomes, the scientific evidence of its use often lags behind. This research indicates that automated self-monitoring of physical activity with direct feedback and goal setting embedded in the care process is effective. Companies could use this knowledge in their marketing strategies for self-monitoring devices. Furthermore they can use the knowledge gathered during the user-centred design process to improve their designs and effectuate products which are better adapted to the end users. An insight which could be valuable for future product development is that if self-monitoring takes place and its data is shared with somebody else, the user should have the opportunity to make annotations, to clarify unusual data. Furthermore, especially for the elderly target group, clear instructions and a helpdesk are a necessary condition for acceptance and implementation.

Health insurance companies

The research presented in this dissertation indicates that self-monitoring embedded in care is an effective intervention to stimulate people to have more physical activity. If the results endure over a longer period of time, this might result in health benefits which will eventually lead to a healthier population, less complications and thus reduces health cost which makes it attractive for insurance companies to offer it to their customers. Especially, if the intervention will be implemented as a preventive method to avoid the onset of chronic disease, this would be profitable. With this in mind, it would also be

worthwhile to consider providing the intervention in a modified form at work or at school to anybody at risk of an inactive lifestyle.

Innovation

The *It's LiFe!* monitoring and feedback tool is not the only tool which enables an objective measurement of one's physical activity level. Step counters, accelerometers worn at the hip or around the wrist with related applications and Smartphones with integrated accelerometers pursue the same goal. However, the marketing around these devices and apps is mostly targeted at people who are already conscious about a healthy lifestyle and act accordingly (the quantified self).⁸ The innovative aspect about this research is that it was targeted at people with a chronic disease who are difficult to motivate and that it brought together the strengths of new technologies and the coaching role of a care provider. With this combination, people who are normally not triggered by persuasive technology are involved and the coaching role from the care provider is reinforced by providing objective measurements. Daily monitoring and feedback broadens the scope of the consultation room.

Planning and realization

The research in this dissertation did reveal some suggestions for improvement of the tool such as more tailored and diverse feedback messages, making the tool suitable for the measurement of swimming and cycling, and adding a possibility to share results with peers for extra social support. The latter was waived by participants in the user requirements research, but opted as a suggestion for improvement in the process evaluation of the RCT. The feasibility study and the process evaluation of the RCT among the nurses revealed that nurses want the physical activity results of their patients to be visible in their own electronic health system, rather than on a website. Furthermore, they indicated that they would like to have the possibility to send feedback messages to the patient, rather than call them in between consultations. This would be a valuable option to explore, since it will personalize the feedback for the patient and in this way it can be sent and read whenever possible.

At this moment, the involved companies, Maastricht Instruments and Sananet are working together with a start-up company named 'A.motion' to bring the *It's LiFe!* tool and its services to the market. Their aim is that at the end of 2015 the product and services should be available. They have already launched a pilot project in physiotherapy practices to further explore the possibilities of the *It's LiFe!* intervention.

In the future more people will monitor their own health variables to get more control over their own health and also be an equal partner in contact with their health professionals. The challenge for system developers and care providers will be to integrate, interpret and react properly on all these different data. Furthermore, a

number of ethical, privacy and interoperability issues have to be solved before the scenario of Mr. Black can become reality.

Referred websites

1. <http://www.netherlandsproteomicscentre.nl/npc/valorisation/what-is-valorisation.html>
2. <http://www.maastrichtuniversity.nl/web/show/id=6637066/langid=43>.
3. <http://www.maastrichtinstruments.nl/portfolio/its-life/>
4. <http://www.sananet.nl/its-life.html>
5. <http://www.zuyd.nl/onderzoek/lectoraten/technologieindezorg/projecten/its-life>
6. http://issuu.com/venvn_vzi/docs/vzi_nieuwsbrief_mei_2014
7. <http://www.innovatiesindezorg.eu/>
8. <http://www.quantifiedself.nl/>